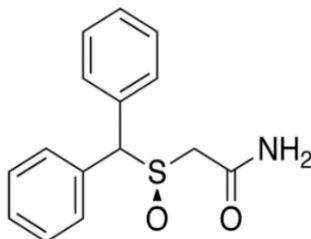




## (R)-Modafinil

The Drug Enforcement Administration's Special Testing and Research Laboratory generated this monograph using structurally confirmed reference material.



### 1. GENERAL INFORMATION

<b>IUPAC Name:</b>	(R)-2-(benzhydrylsulfinyl)acetamide
<b>CAS#:</b>	112111-43-0
<b>Synonyms:</b>	(-)-Modafinil, Armodafinil, (R)-(-)-Modafinil, 2-[(R)-(diphenylmethyl)-sulfinyl]acetamide
<b>Source:</b>	DEA Reference Material Collection
<b>Appearance:</b>	White powder
<b>UV<sub>max</sub>(nm):</b>	Not determined

### 2. CHEMICAL AND PHYSICAL DATA

#### 2.1 CHEMICAL DATA

Form	Chemical Formula	Molecular Weight	Melting Point (°C)
Neutral	C <sub>15</sub> H <sub>15</sub> NO <sub>2</sub> S	273.35	151.36



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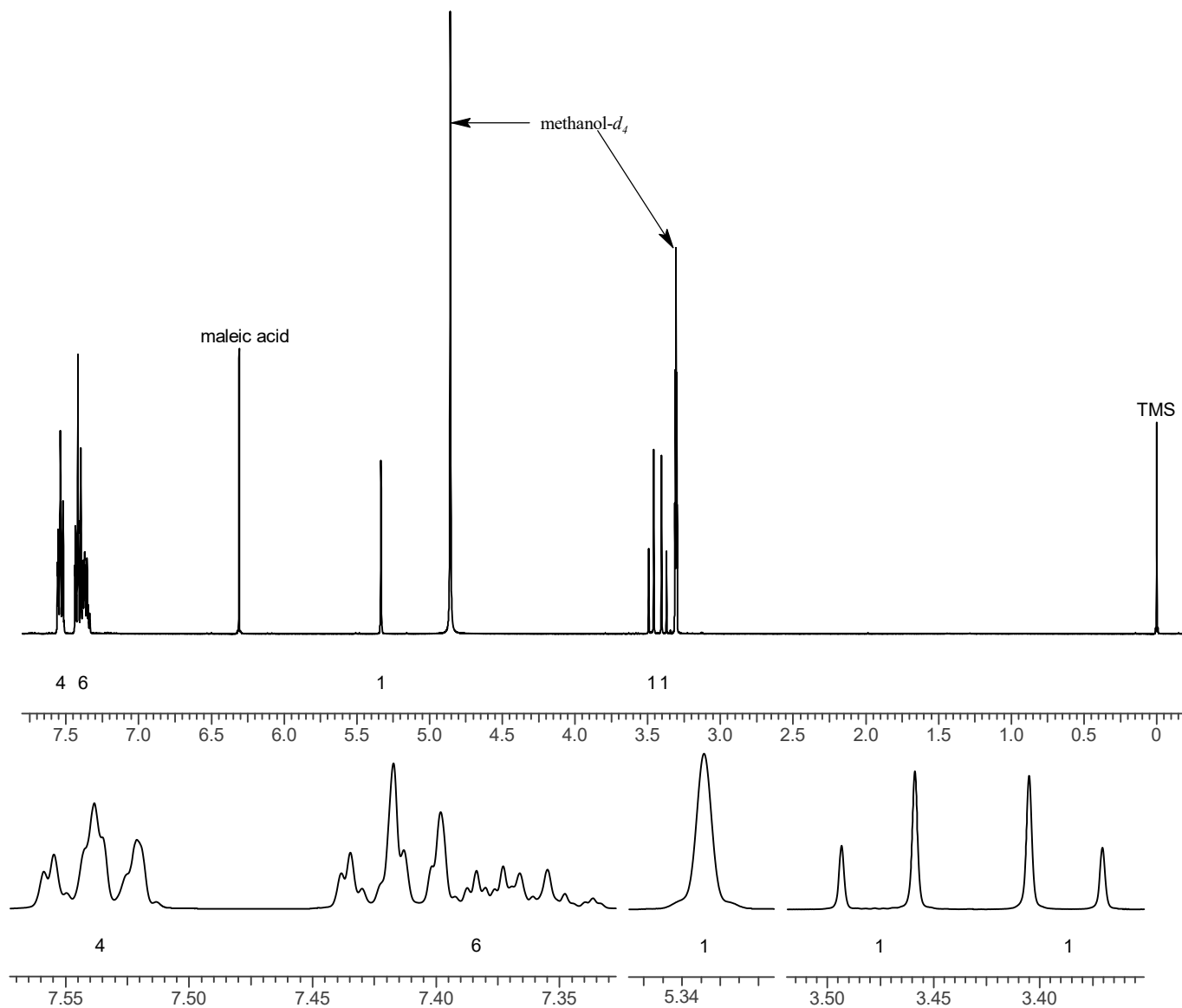
### 3. QUALITATIVE DATA

#### 3.1 NUCLEAR MAGNETIC RESONANCE

*Sample Preparation:* Dilute analyte to ~7mg/mL in methanol- $d_4$  containing TMS for 0 ppm reference and maleic acid as quantitative internal standard.

**Instrument:** 400 MHz NMR spectrometer  
**Parameters:** Spectral width: at least containing -3 ppm through 13 ppm  
Pulse angle: 90°  
Delay between pulses: 45 seconds

$^1\text{H}$ NMR: (R)-Modafinil; Lot# 2-DPM-7-3; methanol- $d_4$ ; 400MHz





## (R)-Modafinil



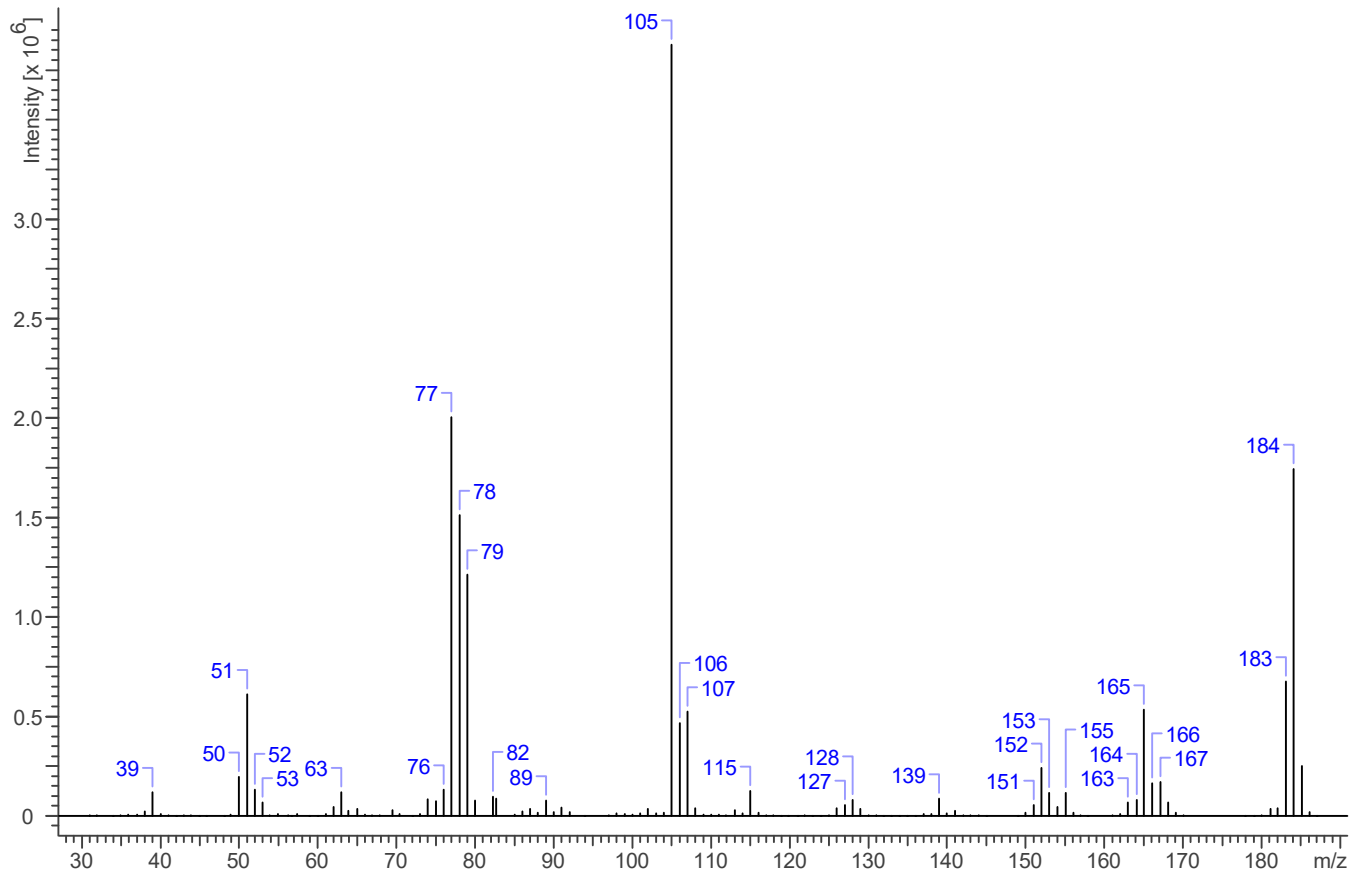
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### 3.2 GAS CHROMATOGRAPHY/MASS SPECTROMETRY

**Sample Preparation:** Dilute analyte ~4 mg/mL in CHCl<sub>3</sub>

**Instrument:** Agilent gas chromatograph operated in split mode with MS detector  
**Column:** HP-5 MS (or equivalent); 30m x 0.25 mm x 0.25 μm  
**Carrier Gas:** Helium at 1.5 mL/min  
**Temperatures:** Injector: 280°C                      MSD transfer line: 280°C  
MS Source: 230°C                      MS Quad: 150°C  
Oven program:  
    1) 100°C initial temperature for 1.0 min  
    2) Ramp to 280°C at 12 °C/min  
    3) Hold final temperature for 9.0 min  
**Injection Parameters:** Split Ratio = 25:1, 1 μL injected  
**MS Parameters:** Mass scan range: 30-550 amu                      Threshold: 250  
Tune file: stune.u                      Acquisition mode: scan  
**Retention Time:** 8.66 min, injection port breakdown product #1

EI Mass Spectrum: (R)-Modafinil; Lot# 2-DPM-7-3





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MS Source: 230°C                      MS Quad: 150°C

Oven program:

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2) Ramp to 280°C at 12 °C/min

3) Hold final temperature for 9.0 min

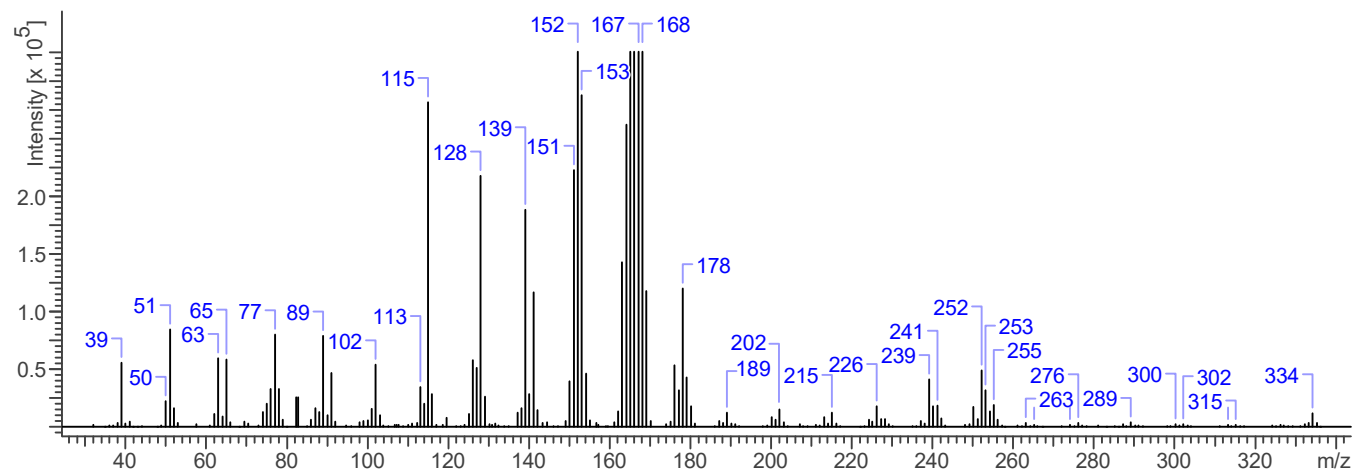
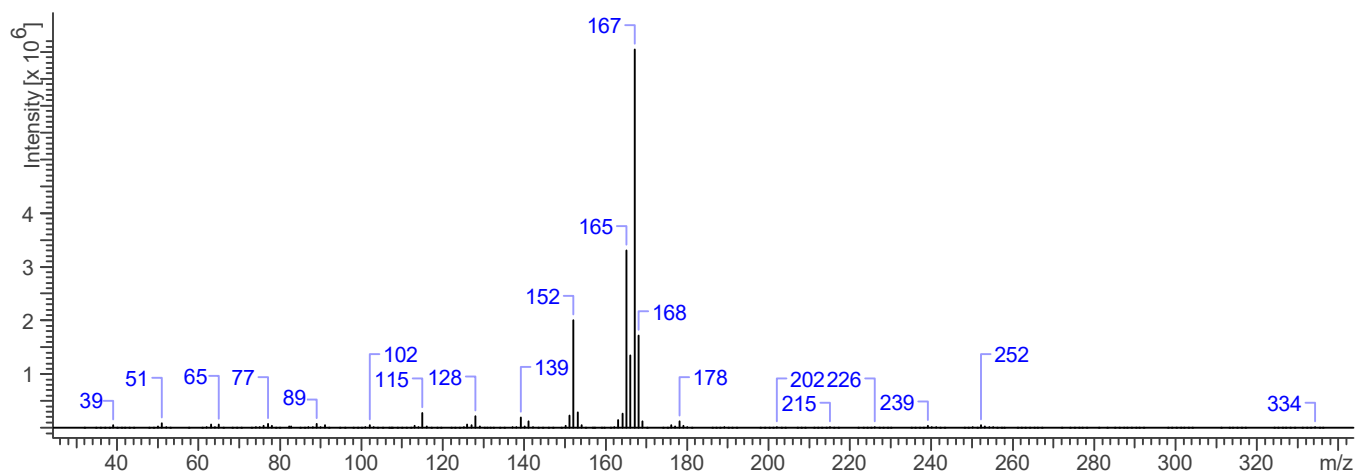
**Injection Parameters:** Split Ratio = 25:1, 1 μL injected

**MS Parameters:** Mass scan range: 30-550 amu                      Threshold: 250

Tune file: stune.u                      Acquisition mode: scan

**Retention Time:** 15.873 min, injection port breakdown product #2

EI Mass Spectrum: (R)-Modafinil; Lot# 2-DPM-7-3





# (R)-Modafinil

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## 3.3 INFRARED SPECTROSCOPY (FTIR)

**Instrument:** FTIR with diamond ATR attachment (1 bounce)

**Scan Parameters:**  
Number of scans: 32  
Number of background scans: 32  
Resolution: 4 cm<sup>-1</sup>  
Sample gain: 1  
Aperture: 150

FTIR ATR (Diamond 1 Bounce): (R)-Modafinil; Lot# 2-DPM-7-3

